

EXHIBIT 90

AUGUST 1, 2018



PERITTAI REPORT OF GARY
YODER

A handwritten signature in blue ink that reads "Gary Yoder". The signature is written in a cursive style and is positioned to the left of a horizontal line.

PRESENTED BY: GARY YODER, VICE PRESIDENT OF ENVIRONMENTAL SERVICES
CLIMECO CORPORATION
1 EAST PHILADELPHIA AVENUE, BOYERTOWN ,PA

REBUTTAL REPORT OF GARY YODER

1. CHINKIN OPINION 1: Mr. Yoder Failed to Follow Industry-Standard Scientific Methods

Mr. Chinkin claims that I did not follow industry-standard scientific methods in my analysis “to estimate emissions based on the best information available, perform air dispersion modeling using the most accurate estimate of emissions, and assess the model outputs in context of what you would expect based on your conceptual model or hypothesis.” He continued to say I “did not attempt to estimate nor specifically quantify PFOA emissions” in this opinion. Contrary to Mr. Chinkin’s opinion, the use of multiple emission rate scenarios for an investigative analysis is completely within the designed uses of AERMOD. My analysis was not intended as a model of the air quality impacts of current or future emissions from a stationary source to be used for air pollution permit approval by a regulatory authority. Such regulatory air dispersion modeling analyses would indeed require a detailed technical basis for specific emission rates used as model input. There are two main reasons why my analysis did not “specifically” quantify PFOA:

1. There is uncertainty in Chemfab’s records as to how much PFOA was present in their dispersion solutions, and
2. Should Dr. Hopke’s understanding of PFOA formation in Chemfab’s coating process be determined accurate (See Dr. Hopke’s report and rebuttal), emissions of the compound would have been much greater than estimated by Barr.

My approach was to confirm general PFOA deposition patterns shown by Barr and the VDEC and present deposition rates and extents resulting from other PFOA emission rate possibilities from the Chemfab operations.

2. CHINKIN OPINION 2: Mr. Yoder Failed to Use Scientific And Engineering Judgement

Based on my review of Mr. Chinkin’s resume, he has degrees in atmospheric science. Without a degree in engineering, he should refrain from expressing an opinion as to whether someone failed to use engineering judgement.

Mr. Chinkin’s claim that I did not use a common scale in my figures is completely inaccurate. The same deposition rate contour color scale was used in Figures 6 through 10 in my report. I chose to use a broader scale with nine (9) contour categories from 0 to 0.01 g/m²/yr. Selecting this scale allowed for visual presentation of varying deposition rates for each of the three modeled emission rate scenarios, which encompassed differing emission rates by two orders of magnitude. Mr. Chinkin presents a scale with only four (4) contour categories with a narrower range from 0 to greater than 0.004 g/m²/yr. These are two different approaches to presenting the same data visually. My approach allowed for visual presentation of additional deposition detail with increasing distance from the Chemfab facility.

I did not specifically correlate the air deposition results to the VDEC groundwater sampling results as the fate of PFOA after it is deposited on a ground surface is not my area of expertise. I do know that changing the lower- or upper-bound would, in fact, change the model results. The bottom line is that changing the bounds would not change my opinion that the modeling shows deposition of PFOA occurred in the areas where PFOA was found in ground water wells.

3. CHINKIN OPINION 3: Mr. Yoder Showed Lack of Rigor And Was Speculative When Developing His Modeling Input And Assumptions

- *Mr. Yoder did not model fugitive (i.e., facility vents, leaks, open doors) emissions even though he acknowledged in his deposition testimony that fugitive emissions are important and that there were reported fugitive emissions at the Chemfab facilities.*

As Mr. Chinkin points out, I was aware from historical documents (resident complaints and Vermont DEC inspections) that there were periodic fugitive emissions from the Chemfab operations. However, as I also stated in my deposition, Chemfab was not permitted by the VDEC to emit fugitive emissions. The facility was only permitted to capture, and control process emissions, which were then to enter the atmosphere via several, tall tower stacks. Emissions of fugitives from leaks, vents, and open doors would have occurred because of either poor operation and/or maintenance or possibly plant personnel decisions to circumvent the conditions of the facility's air permit. Yet, according to Mr. Flechas, he "would have found that ChemFab/SGPP acted in compliance with Vermont air pollution control regulations and that they did so with full knowledge, consent, and support of the regulatory agencies which are responsible for protection of human health." (Flechas p. 11) How can a facility be operating in violation of their air permit because of unpermitted fugitive emissions frequent enough to allocate a significant portion of such emissions as model input, yet also "act in compliance?" The AERMOD input in my analysis simulated the Chemfab operation as they were permitted to operate. There was no documentation available (since it would have been a violation) to estimate a percentage of the PFOA emissions that would have left the facility via vents, leaks, and open doors.

- *Yoder obtained PFOA particle size distributions from Table 2-4 of Barton's dissertation (Barton, 2008). He did not bother to continue to read the Barton dissertation to chapter 4 and thus, he was unaware that a more scientifically robust particle size data set was presented later in Table 4-1 of the same document. The AERMOD deposition model relies on particle size inputs to calculate how quickly particles will disperse and deposit onto the ground. The smaller the particle diameter, the more particles will disperse further away from the emission source. Mr. Yoder should have used particle size data from Table 4-1 as input to AERMOD to get more accurate model results.*

Further research by Dr. Hopke and myself is provided in response to Mr. Chinkin. The Barton (thesis) indicated she used a Tisch Model TE-235 high volume impactor. She wrote: "At each location, sampling equipment consisted of a Tisch Model 235 High Volume Cascade Impactor rented from RAMCON Environmental in Kingston Springs, Tennessee. The complete sampler consisted of the 5-stage impactor head."¹ This 5-stage unit was operated at a nominal flowrate of 40 CFM (41.06 to 48.3 CFM). Since these values were different from the nominal 40 CFM operating parameter, the particle size cut-offs for the various stages would have been calculated using the equation on page 6 of the operating manual (Tisch Environmental, 2004).² There are two different size distributions reported by Barton. In the Barton et al. (2006)³ publication, the size distribution was given in table 4 as follows:

Table 4. Average particle size distribution for PFOA at fence line.

Particle Diameter, μm	Mass Fraction %
>4.0	5.6
1.7	12.9
0.8	9.2
0.5	7.2
0.3	5.3
<0.28	59.8

However, in supplemental material file of Barton et al. (2010)⁴, a different distribution is provided in Table S1 as follows:

Table S1. Fence Line Particle Size Distribution		
Particle Diameter, microns	Mass Fraction	Cumulative % less Than Particle Size
≥ 6.37	0.14	86
2.58	0.19	67
1.24	0.11	56
0.78	0.12	44
0.38	0.09	35
<0.38	0.35	

The supplemental material file indicates that this distribution came from the contractor from whom DuPont rented the sampler, stating “This information was compiled from sampling data collected at the Site in 2005 and reported in “Sampling for Particle Sizing, Washington Works Facility” authored by Ramcon Environmental August 25, 2005, Project #DuPont2005.” This document does not appear to be publicly available and thus, the specific details of the calculations to obtain these values are unknown.

In the prior regulatory dispersion calculations, Vermont Department of Environmental Conservation (DEC) and New Hampshire Department of Environmental Services (DES) used the Barton et al. (2006) distributions. The March 2018 Barr report uses the Barton et al. (2010) distribution and deposition parameters. However, prior versions of the Barr report used the 2006 Barton et al. distribution with no indication as to why they changed distributions. Dreyer et al. (2015)⁵ compared the Barton et al. (2006) distribution with that measured in a suburb of Munich, Germany and concluded “Our PFOA results corroborate findings of Barton et al. (2006) investigating PFOA in particle-size-segregated samples close to a manufacturing facility in the US.”

Further study of the Barton thesis suggests that the 2006 distribution was the result of a single 3-day sampling campaign conducted at 4 sites, whereas the 2010 distribution came from averaging multiple samples collected at multiple sites around the plant. However, in neither case does Barton describe how these “averages” were calculated from the individual particle size distributions nor does she describe why the two distributions have different sizes associated with the results since the

same impactors were used to obtain the original data. One can hypothesize that they represent some type of weighted average values, but specific details are lacking and unavailable.

Additionally, Table S3 is the particle size distribution used for AERMOD air dispersion modeling conducted by Shin et. al. (2011)⁶ for PFOA emissions from the DuPont Washington Works facility in West Virginia (Washington Works).

Table S3. Particle size distribution used in air dispersion modeling by Paustenbach et al. (2007) and Shin based on the particle size data in Table S2.

Paustenbach		Shin	
Particle size (µm)	Mass fraction (%)	Particle size (µm)	Mass fraction (%)
0.2	0.54	0.1	0.35
0.4	0.27	0.18	0.087
0.75	0.04	0.38	0.227
2.0	0.13	0.44	0.07
4.0	0.3	0.53	0.047
		0.63	0.003
		0.77	0.053
		1.0175	0.063
		1.3375	0.03
		1.75	0.00
		2.85	0.03
		14.85	0.033

Shin et. al. (2011) stated that this distribution was developed from direct measurements at Dupont's Washington Works facility. Table S3 was obtained from the author and is a comparison of the particle size distribution used in his research to that of previous research completed by Paustenbach et al. (2007),⁷ who collapsed the same Washington Works data to create his ranges. The AERMOD Method 2 mean-mass particle size diameter input value calculated from the Shin et. al (2010) distribution is the same as Barton et. al. (2006). Additionally, the mass fraction <2.5 µm in the Shin et. al (2011) data set is 93% whereas Barton et. al. (2006) is 94.4% (also an AERMOD Method 2 input parameter).

With the calculations supporting the Barton (2010) distribution unavailable, the Barton (2006) distribution is currently the best information available for AERMOD input. Barton (2006) was also used for the Vermont DEC, New Hampshire DES, and Shin (2011) PFOA deposition analyses. Regardless, the differences between the Barton (2006) and Barton (2010) distributions are very small and the two distributions are very well correlated ($r^2 = 0.926$). Thus, the choice of distributions will not result in significant differences in AERMOD deposition results.

4. CHINKIN OPINION 4: Mr. Yoder's Analysis Failed to Account For Other Sources Or Background Levels Of PFOA.

OTHER SOURCES

My report is a presentation of results of PFOA deposition resulting from emission rate scenarios from the Chemfab operations. The analysis provides probable deposition rates of PFOA (g/m²/yr)

on nearby ground surfaces at different emission rates. The analysis did not attempt to determine the fate of the PFOA after atmospheric deposition as such an attempt would have been beyond my area of expertise. Mr. Chinkin's Section 4.1 includes a list of historical entities and amounts of waste deposited in local landfills with the claim that these entities are also contributors to Bennington's subsurface PFOA concentrations. Based on my review, Chemfab was the only historically significant source for atmospheric deposition PFOA in Bennington, VT and is why it was the only source included in my air dispersion modeling analysis.

BACKGROUND PFOA

Mr. Chinkin states "EPA's best practice guidance document for air modeling, Appendix W (40 CFR Ch. I, Part 51), provides guidance for handling background chemical concentrations." Mr. Chinkin may be unaware that 40 CFR Part 51 (Part 51) - Requirements for Preparation, Adoption, and Submittal of Implementation Plans, is a set of federal air quality regulations for USEPA-designated states to demonstrate that the National Ambient Air Quality Standards (NAAQS) are met and protected. The NAAQS compounds (criteria pollutants) are sulfur dioxide, volatile organic compounds, nitrogen dioxide, carbon monoxide, lead, PM2.5, PM10, ammonia, and ozone (§51.15). The preface to 40 CFR Appendix W to Part 51 states "The *Guideline* provides a common basis for estimating the air quality concentrations of criteria pollutants used in assessing control strategies and developing emission limits." PFOA (and the family of similar compounds) is not a Part 51 regulated criteria pollutant. As a result, states currently do not conduct ambient monitoring of PFOA and therefore Appendix W procedures cannot be followed to include it as background in air dispersion modeling demonstrations.

To include PFOA background concentrations into my air dispersion modeling analysis, an independent monitoring program would have to have been conducted representative of Bennington, VT. There are no known studies of background air concentrations of PFOA in the Bennington, VT area. It should be noted that background PFOA concentrations were not incorporated into the Barr (March 2018) or similar Barton et. al. (2010) and Shin et. al. (2011) analyses. Regardless, my air dispersion modeling analysis (as well as Barr and the VDEC analyses) present the contribution from Chemfab's operation alone. In other words, my results use three possible Chemfab PFOA emission rates to determine the probable resulting deposition rates in Bennington, VT, and do not include any potential contribution from background or other emission sources. It is likely that if PFOA exists in Bennington's background ambient air, it is a very low concentration. Otherwise, PFOA would have been found in the groundwater throughout the area, including in areas outside the Zone of Contamination where wells where there is no PFOA detected in drinking water wells.

5. REFERENCES

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